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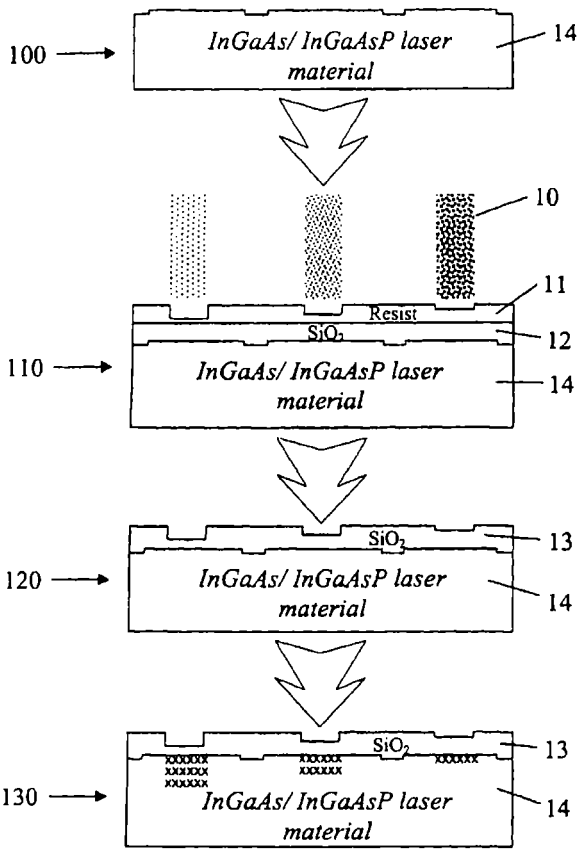
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(54) Title: QUANTUM WELL INTERMIXING



(57) Abstract: The present invention provides a novel technique based on gray scale mask patterning (110), which requires only a single lithography and etching step (110, 120) to produce different thickness of SiO_2 implantation mask (13) in selected regions followed by a one step IID (130) to achieve selective area intermixing. This novel, low cost, and simple technique can be applied for the fabrication of PICs in general, and WDM sources in particular. By applying a gray scale mask technique in IID in accordance with the present invention, the bandgap energy of a QW material can be tuned to different degrees across a wafer (14). This enables not only the integration of monolithic multiple-wavelength lasers but further extends to integrate with modulators and couplers on a single chip. This technique can also be applied to ease the fabrication and design process of superluminescent diodes (SLDs) by expanding the gain spectrum to a maximum after epitaxial growth.

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